

REMARKS

The Examiner, Mr. Berman, is thanked for the courtesy extended applicants attorney during the telephone discussion of September 24, 2009, wherein the undersigned attorney proposed amending the claims to clarify the inherent features of the claims that defect candidates were extracted or detected actual images of the extracted or detected defect candidates were outputted together with data including the location of the defect candidates, the outputted actual images and data including the location of the defect candidates were stored, noting, for example, that claim 5 recites the feature of displaying "a selected one of the stored actual images of the extracted defect candidates ..." (emphasis added), as well as "displaying on a screen in a map format the defect candidate location data", which should properly be termed "the defect candidates location data", since a plurality of defect candidates are shown in map format in Fig. 8 of the drawings of this application, for example. Thus, the amendments of the claims are merely of a clarifying nature to utilize "images" and "candidates" throughout the entirety of the claims, and to clarify the recited features.

The Examiner indicated that although the amendment would not appear to render the claims allowable over the cited art, that such amendment would be entered for purposes of appeal. In light of such indication, submitted together with this amendment is a Notice of Appeal, to avoid the payment of an additional extension of time for one month, beyond the two month extension of time, submitted herewith.

By the present amendment, the independent and dependent claims have been amended as discussed with the Examiner so as to clarify and utilize consistent language throughout.

As to the rejection of claims 3, 5, 6, 12 - 16 and 25 - 37 under 35 USC 103(a) as being unpatentable over Mizuno et al (US Patent No. 6,047,083) in view of Worster et al (US Patent No. 5,963,314); and the rejection of claims 10, 11 and 20 - 24 under 35 USC 103(a) as being unpatentable over Mizuno et al and Worster et al further in view of Gallarda et al (US Patent No. 6,539,106); such rejections are traversed insofar as they are applicable to the present invention, as amended, and reconsideration and withdrawal of the rejections are respectfully requested.

In applying Mizuno to the claimed invention, applicants submit that the Examiner mischaracterizes the actual disclosure of Mizuno. That is, while the Examiner contends that Mizuno discloses "comparing the digital image with a reference image and extracting a defect candidate (lines 44 - 53 in column 3); outputting an actual image of the extracted defect candidate and data comprising the location of the defect candidate via a storage medium (lines 41 - 43 in column 6); storing said outputted actual image of the extracted defect candidate and data comprising the location of the defect candidate (lines 39 - 41 in column 6) ..." (emphasis added). Irrespective of the contentions by the Examiner, applicants submit that as described in Mizuno and as illustrated in Figs. 3, 4, 6A and 6B thereof, a reference SEM image is stored in the memory 23, and such recorded SEM image is utilized for comparison purposes with a SEM image, which is obtained for inspection

purposes. As described in column 4, lines 41 - 44, "After the wafer map has been displayed, the operator specifies the point or points corresponding to one or more portions to be inspected of the points which are displayed on the wafer map as shown in step (7)". As described in column 4, line 66 to column 5, line 7, the SEM image for inspection is compared with a reference SEM image (a reference image or inspection) representing the "RECORDED REF. IMAGE" as shown in step 11 of Fig. 3, noting that Figs. 2A - 2D illustrate images obtained, which upon comparison, represent defects, wherein column 5, lines 3 - 7 indicate that the difference portion is regarded as a pattern defect and the pattern defects are classified at least into types of a short circuit, line breakage, protrusion, cavity, thin hole and isolation in step (12), as described in columns 5 and 6 of Mizuno. The manner of defect classification is described wherein column 6, lines 50 - 58 provide "Of course, the reference image is stored in the memory within the processor. After determination of the existence of the defect at the specified point to be inspected and the defect classification have been finished, the result of the classification is overwritten on the specified point to be inspected on the wafer map and also stored in an inspection data base. In this way inspection of one point is completed." (emphasis added). Applicants note that Fig. 6B represents a display of the wafer map of Fig. 6A, which has been overwritten with classification data at the specified points. Applicants submit that in accordance with Mizuno, such information is stored in the database of the memory 23, which also stores the reference image. However, applicants submit that contrary to the contentions by the Examiner, although Mizuno may be considered to output an actual

image representing the SEM image for inspection, which is utilized for comparison purposes with a stored reference image, so as to determine a defect at a specified point, which defect is classified and the defect information is stored as represented by the indicia of Fig. 6B of Mizuno, applicants submit that Mizuno does not store outputted actual images of the extracted defect candidates and, as recognized by the Examiner, does not display on a screen a selected one of the stored actual images of the extracted defect candidates which is designated on the screen among the extracted defect candidates data displayed in the map format so that the selected one of the stored actual images of the extracted defect candidates is displayed together with the map format on the screen without revisiting the substrate surface and the designated defect candidate of the substrate surface to produce an actual image of the designated defect candidate of the substrate surface, as recited in claim 5 and other claims of this application. Accordingly, applicants submit that the features of the independent claims patentably distinguish over Mizuno in the sense of 35 USC 103 and should be considered allowable thereover.

The Examiner cited Worster et al for the teaching that a display of a wafer map and images corresponding to locations on the wafer map at the same time is useful. However, applicants again point out that the Examiner has mischaracterized the disclosure of Mizuno, and Mizuno does not disclose or teach storing of outputted actual images of defect candidates together with the location data thereof and only discloses storing a reference image for comparison purposes, with an actual image to determine a defect which is

classified with the classification information being stored together with the location information. Applicants submit that Worster et al fails to overcome the deficiencies of Mizuno, as pointed out above. That is, while Fig. 4 of Worster et al may be considered to display a wafer map in the lower left hand corner of Fig. 4, and an actual image of a defect in the upper right hand portion of Fig. 4, in accordance with Worster et al, a laser imaging system 100 is utilized for imaging the wafer, and as indicated in column 14, lines 4 - 6, "The Laser Window directly displays the live laser image produced by the scanning laser beam". (Emphasis added). As described in column 14, lines 36 - 39 "The Wafer Map Window displays the defect map of the wafer under inspection, the defect map having been produced by a wafer scanner that is not part of the laser imaging system 100... The operator can select a defect to revisit..." (emphasis added). Thus, it is apparent that in accordance with Worster et al, after displaying the wafer map, which is obtained by a wafer scanner which is not part of the laser imaging system 100, the operator selects a defect to be revisited from the defects indicated on the wafer map, and obtains an actual laser image by revisiting such defect, and then displays the newly obtained an actual image together with the wafer map. Thus, applicants submit that Worster et al, like Mizuno, fails to disclose or teach storing of actual images of defects detected and displaying the stored action image of a selected defect together with the map format of the defects, as recited in each of the independent and dependent claims of this application. Thus, applicants submit that all claims recite features which patentably

distinguish over the combination of Mizuno and Worster et al in the sense of 35 USC 103 and all claims should be considered allowable thereover.

With regard to the addition of Gallarda et al to the combination of Mizuno and Worster et al, irrespective of whether or not Gallarda et al discloses defect classification, Gallarda et al does not overcome the deficiencies of Mizuno and Worster et al as pointed out above, in that Gallarda et al also fails to disclose storing of actual images of defects together with location data thereof and displaying the defects in a wafer map format together with display of a stored actual image of a selected defect. Accordingly, applicants submit that all claims patentably distinguish over this proposed combination of references.

In view of the above amendments and remarks, reconsideration and allowance of all claims in this application is respectfully requested.

As noted above, in light of the telephone discussion with the Examiner, submitted herewith is a Notice of Appeal to avoid payment of a third month extension of time. It is noted, however, if the Examiner now considers this application to be allowable, the filing of the Appeal becomes moot.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the

deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 501.41125X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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